

## REMARKS

Claims 1-14 are pending in this application. At the outset, Applicants wish to thank the Examiner for indicating that claim 5 would be allowable if rewritten in independent form including all of the limitations of the base claim and intervening claims. By this Amendment, claim 5 has been amended to put it in independent form. Claim 1 has been amended to more particularly point out and distinctly claim that the recited polymerization takes place in the gas phase. Claim 15 is new, support for which can be found in claim 3. Claim 6 has been canceled without prejudice or disclaimer. Claims 7 and 8 have been amended to depend upon claim 1. Entry and consideration of this Amendment is earnestly requested in that no new matter has been introduced.

### *Claim Rejections*

#### Rejections Under 35 U.S.C. § 103

##### A. Response to rejection of claims 1-4 and 6-14 under 35 U.S.C. §103(a) as being unpatentable over Chiba in view of Korvenoja et al.

In response to the rejection of claims 1-4 and 6-14 under 35 U.S.C. 103(a) as being unpatentable over Japanese Patent JP 63075009 of Chiba ("Chiba") in view of U.S. Patent No. 5,204,303 of Korvenoja et al. ("Korvenoja"), Applicants respectfully submit that a *prima facie* case of Obviousness has not been made out, and traverse the Rejection.

The U.S. Supreme Court in *Graham v. John Deere Co.*, 148 U.S.P.Q. 459 (1966) held that non-obviousness was determined under §103 by (1) determining the scope and content of the prior art; (2) ascertaining the differences between the prior art and the claims at issue; (3) resolving the level of ordinary skill in the art; and, (4) inquiring as to any objective evidence of non-obviousness. Accordingly, for the Examiner to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. See MPEP §2143. Finally, all claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 U.S.P.Q. (BNA) 580 (C.C.P.A. 1974).

First, as acknowledged by the Examiner, Chiba does not expressly teach (i) using a comonomer in the second stage, and (ii) internal electron donors besides polysiloxane. However, contrary to the Examiner's argument, Chiba also does not teach conducting gas phase ethylene polymerization in two stages. Applicants respectfully submit that Chiba actually teaches a slurry polymerization where the reactor(s) contain a discrete gas phase:

The method for continuous production of polyethylene described in previous item (1) wherein,

(i) the first stage of polymerization is conducted in a saturated hydrocarbon solvent at a polymerization temperature of 50-120°C and polymerization pressure of 2-70 kg/cm<sup>2</sup> under the condition of having a gas phase at the upper reactor by feeding 30-80 wt% of the total quantity of ethylene and hydrogen to maintain an ethylene to hydrogen molar ratio of 1/3.0 to 1/7.0 in the gas phase in the polymerization reactor;

(ii) the second stage of polymerization is conducted by drawing the polymer suspended in the solvent to a pressure of 1-60 kg/cm<sup>2</sup> after completing the first stage of polymerization and recycling at least part of the hydrogen in the gas phase back to the first stage of polymerization, followed by polymerizing at polymerization temperature of 30-100°C and polymerization pressure of 2-70 kg/cm<sup>2</sup> (page 7, lines 9-18, emphasis added)

and

the first stage of polymerization is conducted ... in the presence of a saturated hydrocarbon solvent and under the condition of having a gas phase in the upper reactor. The molecular weight of the polymer formed is regulated by feeding ethylene and hydrogen to maintain an ethylene to hydrogen molar ratio of 1/3.0 to 1/7.0 in the gas phase in the polymerization reactor. (page 8, lines 2-7)

The above portions of Chiba teach the presence of a gas phase, such that ethylene and hydrogen flows to the reactor are adjusted to maintain a desired ethylene/hydrogen ratio in that gas phase. However, this in no way teaches, suggests or discloses a gas-phase polymerization, as recited in the current claims. Chiba could not be clearer in that its teaching relates to a slurry polymerization. This is further demonstrated in view of Chiba's examples. Example 1 illustrates a polymerization carried out in hexane. Hexane's boiling point at 1 atmosphere (1.03 kg/cm<sup>2</sup>) is

approximately 69°C, so that at the 12 kg/cm<sup>2</sup>, 90°C polymerization conditions of Example 1, Applicants believe that hexane would be present substantially as a liquid, and the polymerization would take place in the suspension.

Korvenoja does not remedy the deficiencies of Chiba because the only gas-phase polymerization illustrated in Korvenoja is a one-step polymerization without use of comonomer. In fact, Korvenoja actually teaches away from the present claims inasmuch as it's procatalyst is useful for the "the preparation of ethylene having a narrow molecular weight distribution;" (col. 2, lines 58-61, emphasis added) whereas, the ethylene polymers described in the claimed process have a broad molecular weight distribution (page 15, lines 2-3). Similarly, Korvenoja teaches away from combination with Chiba, since Chiba criticizes narrow molecular weight material:

When polyethylene with a ***narrow molecular weight*** is subjected to hollow molding, the extrusion pressure tends to increase excessively during molding; the molding ***becomes difficult*** or ***significant defects*** occur in the product appearance due to formation of strands or pits or melt fracture. (page 4, lines 9-11, emphasis added)

In response to Applicants' arguments from the previous Office Action, the Examiner argued that combination of Chiba and Korvenoja would produce broad molecular weight distribution material:

The broad molecular weight distributions of Chiba's ethylene polymer compositions are due to the low and high molecular weight fractions of ethylene polymers prepared in the first and second stage respectively. No matter how narrow is the molecular weight distribution for each of the two fractions, the molecular weight distribution for the bimodal ethylene polymer composition blend will always be broad. That is, when Korvenoja's catalyst composition is used in Chiba's ethylene polymerization process, an ethylene polymer with bimodal molecular weight distribution will be produced and the ethylene polymers with bimodal molecular weight distributions are always expected to have broad molecular weight distribution. (page 3, line 21 to page 4, line 7).

First, the Examiner has assumed that because low and high molecular weight fractions of ethylene polymers can be produced in Chiba's first and second stages, that the resultant polymer

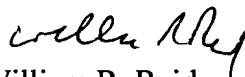
would meet Applicants' claim feature directed to MIF/MIP, since there is no express teaching of the MIF/MIP ratio in Chiba. However, even if one assumes for the sake of argument that the technical effect that the Examiner argues is correct, the Examiner has simply ignored that it is improper under both Federal Circuit teaching and the MPEP to combine references where the references teach away from their combination (MPEP 2145 XD2, citing *In re Grasselli*, 713 F.2d 731, 743, 218 USPQ 769, 779 (Fed. Cir. 1983)). Reconsideration and withdrawal of the Rejection respectfully is requested.

Applicants respectfully request that a timely Notice of Allowance be issued in this case. Should the Examiner have questions or comments regarding this application or this Amendment, Applicants' attorney would welcome the opportunity to discuss the case with the Examiner.

The Commissioner is hereby authorized to charge U.S. PTO Deposit Account 08-2336 in the amount of any fee required for consideration of this Amendment.

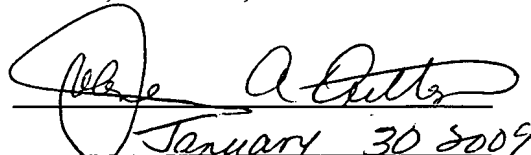
This is intended to be a complete response to the Office Action mailed September 12, 2008.

Respectfully submitted,



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I hereby certify that this correspondence is being deposited with sufficient postage thereon with the United States Postal Service as first class mail in an envelope addressed to: Mail Stop RCE, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on January 30, 2009.

  
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